Vaccine implementation reduces inequity

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While *Streptococcus pneumoniae* was first described over 100 years ago, it wasn't until 50 years later that the first vaccines—pneumococcal polysaccharide vaccines at the time—were available.[1] The use of the pneumococcal polysaccharide vaccines had an important effect on pneumococcal infections, especially in adults.[1] However, that effect was hampered because the number of circulating serotypes was higher than initially anticipated, with about a hundred serotypes currently known.[2] Moreover, the effect of polysaccharide vaccines is unfortunately reduced in some target groups, particularly young children, who react poorly to polysaccharides.[1,3,4]

In the 1990s and early 2000s, pneumococcal conjugate vaccines (PCV) emerged.[1,4] By conjugating proteins to the different capsular polysaccharides, a T-cell immune reaction is elicited, resulting in sufficient immune response in children. However, the number of serotypes that can be conjugated to the capsular polysaccharides is limited in the available formulations. The initial seven-valent vaccine was later replaced with higher valent vaccines. The effects of PCVs, especially higher valent PCVs, on invasive pneumococcal disease,[3,5,6] respiratory infections,[5,7] nasopharyngeal carriage,[6,8] and acute otitis media[5,9] have been widely published and are indisputable.[4] Nevertheless, the global burden of disease of pneumococcal infections is still enormous, with a high annual global mortality, especially in children in lower-income countries.[1,6]

Nasopharyngeal carriage is thought to be a prerequisite for clinically symptomatic pneumococcal infections and carriage rates are especially high in young children.[3,4,6,8] Therefore, studying pneumococcal nasopharyngeal carriage can give important information on circulating serotypes in the community, potential invasiveness, and microbial resistance patterns.[4,6] PCVs have a clear effect on the nasopharyngeal carriage, with a decrease of horizontal spread and a distinct reduction in vaccine-serotype pneumococci.[6,8] This decrease in horizontal spread can also lead to an increased herd effect, which adds to the primary effect of the vaccines. However, despite the effects on vaccine-serotype pneumococci, the total pneumococcal carriage rates are either not affected or marginally affected, as vaccine-serotype pneumococci are replaced by non-vaccine serotypes.[2–5] As long as these non-vaccine serotypes colonising the nasopharynx are less invasive, cause less pneumococcal infections, and are susceptible to antibiotics, the overall effects of the vaccine programmes should be regarded as extremely successful. Nevertheless, it is obviously important to closely monitor any changes in the nasopharyngeal carriage of pneumococcal serotypes because new serotypes, possibly invasive and antibiotic resistant, might emerge and pose a threat for clinically significant infections in the future.[4,6]

In the *Lancet Global Health*, Eileen M Dunne and colleagues[10] report the results of four annual carriage surveys in Fiji on the effect of ten-valent PCV introduction in Fiji. They described a decline in adjusted prevalences (2015 *vs* 2012) in pneumococcal nasopharyngeal carriage of vaccine serotypes in 5–8-week-old infants (0·56, 95% CI 0·34–0·93), 12–23-month-old children (0·34, 0·23–0·49), 2–6-year-old children (0·47, 0·34–0·66), and their caregivers (0·43, 0·13–1·42) 3 years after PCV introduction. These results support a strong herd protection in the community, as evident in the carriage decline described in infants too young to be vaccinated. This important finding adds to earlier publications on the herd effect of PCV, in both children and older populations.[5,7,8]

An important message of the study by Dunne and colleagues is the unambiguous effect of PCV introduction on carriage of vaccine serotypes on both the Indigenous population and the population of Indian descent in Fiji. It is well described that the rate of pneumococcal nasopharyngeal carriage is different in various populations and age groups, often high in Indigenous populations, low-income communities, crowed households, and low socioeconomic status.[3,4,8] This translates into higher risk of infections caused by pneumococcus in these groups, adding to this inequity.

This study from Fiji reiterates the knowledge that initiating vaccination programmes can not only decrease severe infections, but also reduce inequity and disparity. That is important!

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